REMARKS

INTRODUCTION:

In accordance with the foregoing, claims 1, 4, 6, 7 and 8 have been amended. No new matter is being presented, and approval and entry are respectfully requested.

Claims 1, 4, 6, 7, and 8 are pending and under consideration. Reconsideration is respectfully requested.

COMMENTS RE RESPONSE TO ARGUMENTS:

In the Office Action, at pages 2-3, numbered paragraphs 1-4, the Examiner commented on Applicants' arguments.

Claim 1 has been amended to recite:

A relaying apparatus for use in a network system, the network system including a plurality of client terminals and server terminals providing services to those client terminals via a network, the relaying apparatus comprising:
a plurality of route load measuring units each provided in, or in the vicinity of, each of said server terminals and each measuring a respective load in a ~~TCP/UDP~~ TCP or UDP delivery route from the route load measuring unit to one client terminal having issued a request for service out of said client terminals; and
a selecting unit which selects one server terminal out of said server terminals as a destination of the request for service from said one client terminal based on the load measured by said route load measuring units, wherein each of said route load measuring units monitors operating states of respective server terminal and when a request for service is received from said one client terminal, said selecting unit selects one server terminal out of said server terminals as a destination of the request for service from said one client terminal based on the load and the operating states monitored by said load measuring units, wherein operating states include idle and active states; and
a storing unit which stores the load measured at a pre-specified time interval by each of said route load measuring units,
wherein when a request for service is received from said one client terminal, said selecting unit selects said one server terminal out of said server terminals as a destination of the request for service from said one client terminal based on the load stored in the storing unit, and
wherein said route load measuring units each measures, as the load, an effective bandwidth of the route~~, the effective bandwidth estimated~~ based on a plurality of parameters, wherein the parameters include
a round-trip time,
a maximum segment size, and
~~one of: (a)~~ an adjustable congestion-evading congestion window size for a server terminal utilizing TCP,
wherein one of the route load measuring units is selected as a primary destination by the selecting unit based on the route load, and
~~(b)~~ where UDP is utilized, a number of simulated sessions for a server terminal utilizing UDP is used to select a server terminal for a secondary destination of routing.

Independent claims 4, 6, 7, and 8 have been amended in similar fashion.

Jindal utilizes a central server to distribute loads to a plurality of servers (see FIG. 2 of

Jindal). In contrast, the present claimed invention utilizes a primary destination of routing to a route load measuring unit based on certain parameters and then utilizes a secondary destination of routing to a server based on its operating state, as shown in FIG. 5 and recited in the specification, p. 17, lines 13-25:

> Further, when a request for service is received from the client terminal, <u>the route load measuring unit measures a respective load in the route up to the client terminal</u> <u>and a route load measuring unit is selected as a primary destination</u> by the selecting unit based on the route load. <u>Then this route load measuring unit selects one server terminal in the group as a server terminal for secondary destination of routing</u>. (emphasis added)
>
> Thus, <u>the primary destination of routing the service request is selected based on the path load which reflects the actual situation</u>, and <u>a server terminal is selected as a secondary destination of routing based on its operating state</u>. Therefore, work load can further optimally be distributed among the many server terminals. (emphasis added)

Martin utilizes a message dispatcher configured to receive external client requests for a multi-computer server and to dispatch the client requests to selected server computers based on parameters representative of network loading on the server network links, wherein the parameters are representative of return traffic on the server network links. In contrast, as set forth above, the present claimed invention uses a plurality of route load measuring units to measure a respective load in the route up to the client terminal, a route load measuring unit is selected as a primary destination by the selecting unit based on the route load, and then the selected route load measuring unit selects one server terminal in the group as a server terminal for a secondary destination of routing

Thus, differences between the cited art are now believed to be clear, and amended independent claims 1, 4, 6, 7, and 8 are submitted to be patentable over the cited art.

REJECTION UNDER 35 U.S.C. §112:

A. In the Office Action, at page 4, numbered paragraphs 6-7, claims 1, 4, and 6-8 were rejected under 35 U.S.C. §112, first paragraph, for the reasons set forth therein. This rejection is traversed and reconsideration is requested.

It is respectfully submitted that independent claim 1 ~~recites~~<u>has been amended to recite:</u>

> A relaying apparatus for use in a network system, the network system including a plurality of client terminals and server terminals providing services to those client terminals via a network, the relaying apparatus comprising:
> a plurality of route load measuring units each provided in, or in the vicinity of, each of said server terminals and each measuring a respective load in a ~~TCP/UDP~~ <u>TCP or UDP</u> delivery route from the route load measuring unit to one client terminal having issued a request for service out of said client terminals; and
> a selecting unit which selects one server terminal out of said server terminals as a destination of the request for service from said one client terminal based on the load measured by said route load measuring units, wherein each of said route load measuring units monitors operating states of respective server terminal and when a request for

service is received from said one client terminal, said selecting unit selects one server terminal out of said server terminals as a destination of the request for service from said one client terminal based on the load and the operating states monitored by said load measuring units, wherein operating states include idle and active states; and
a storing unit which stores the load measured at a pre-specified time interval by each of said route load measuring units,
wherein when a request for service is received from said one client terminal, said selecting unit selects said one server terminal out of said server terminals as a destination of the request for service from said one client terminal based on the load stored in the storing unit, and
wherein said route load measuring units each measures, as the load, an effective bandwidth of the route~~, the effective bandwidth estimated~~ based on a plurality of parameters, wherein the parameters include
a round-trip time,
a maximum segment size, and
~~one of:~~ ~~(a)~~ an adjustable congestion-evading congestion window size for a server terminal utilizing TCP,
wherein one of the route load measuring units is selected as a primary destination by the selecting unit based on the route load, and
~~(b)~~ where UDP is utilized, a number of simulated sessions for a server terminal utilizing UDP is used to select a server terminal for a secondary destination of routing.

Independent claims 4, 6, 7, and 8 have been amended in similar fashion.

As stated on page 38 of the specification, the path load measuring device monitors the information on the operating state, including "A number of simulated sessions for the server (A number of sessions simulatedly prepared for a communication protocol not having a session such as UDP)." As shown in FIG. 5, for example, the path load measuring device acquires operating state information (SD2) and makes a decision of a destination for routing. It is respectfully submitted that the selection of "a number of simulated sessions for a server terminal utilizing UDP" has a narrowing effect rather than a broadening effect, and is permitted by the courts. That is, it is clear that the path load measuring device does more than simply measure, and utilizes information about the operating state in determining a destination for routing. As stated on lines 8-21 of page 16 of the specification:

> Further, each of the route load measuring units monitors the operating states of respective server terminal. When a request for service is received from the client terminal, the selecting unit selects a server terminal as a destination of the request for service from the client terminal based on the route load and the operating states monitored by the load measuring units. Accordingly, the client terminal can access a server terminal which is in the best operating condition and receive a service provided by this server terminal. (emphasis added)
>
> Thus, not only the path load but also the operating state of a server terminal is taken into account when selecting a destination of routing a service request. Therefore, work load can further optimally be distributed among the many server terminals. (emphasis added)

As shown in FIG. 5, the specification clearly states, p. 17, lines 13-25:

> Further, when a request for service is received from the client terminal, the route load measuring unit measures a respective load in the route up to the client terminal and

> a route load measuring unit is selected as a primary destination by the selecting unit based on the route load. Then this route load measuring unit selects one server terminal in the group as a server terminal for secondary destination of routing. (emphasis added)
>
> Thus, the primary destination of routing the service request is selected based on the path load which reflects the actual situation, and a server terminal is selected as a secondary destination of routing based on its operating state. Therefore, work load can further optimally be distributed among the many server terminals. (emphasis added)

Since FIG. 5 clearly shows that the path load measuring device acquires operating state information, and "a number of simulated sessions for a server terminal utilizing UDP" is set forth in lines 19-21 of page 38 of the specification as information concerning the operating state that is monitored, it is clear that the path load measuring device may utilize the number of simulated sessions for a server terminal utilizing UDP as a parameter in determining a destination for routing. Clearly, the user may set a predetermined number of simulated sessions in accordance with desired settings.

Thus, it is respectfully submitted that independent claims 1, 4, 6, 7, and 8 are patentable under 35 U.S.C. §112, first paragraph.

B. In the Office Action, at pages 5-6, numbered paragraphs 8-12, claims 1, 4, and 6-8 were rejected under 35 U.S.C. §112, second paragraph, for the reasons set forth therein. This rejection is traversed and reconsideration is requested.

Independent claims 1, 4, 6, 7, and 8 have been amended to change "TCP/UDP" to recite ---TCP or UDP--- for clarity. Hence, it is submitted to be clear that the terminology "TCP/UDP" refers to "TCP or UDP," not "TCP and UDP," as submitted by the Examiner.

It is respectfully submitted that the amendments of claims 1, 4, 6, 7 and 8 clarify how selection of a number of simulated sessions for a server terminal utilizing UDP are utilized.

With respect to the Examiner's concerns about the terminology "measures" and "estimated," it is respectfully submitted that the amendments of claims 1, 4, 6, 7 and 8 clarify the term "measures." The terminology "estimated" has been cancelled for clarity.

As shown in FIG. 5, the specification clearly states, p. 17, lines 13-25:

> Further, when a request for service is received from the client terminal, the route load measuring unit measures a respective load in the route up to the client terminal and a route load measuring unit is selected as a primary destination by the selecting unit based on the route load. Then this route load measuring unit selects one server terminal in the group as a server terminal for secondary destination of routing. (emphasis added)
>
> Thus, the primary destination of routing the service request is selected based on the path load which reflects the actual situation, and a server terminal is selected as a secondary destination of routing based on its operating state. Therefore, work load can further optimally be distributed among the many server terminals. (emphasis added)

Hence, it is respectfully submitted that, in the present invention, it is clear how the effective bandwidth is calculated, that one of the route load measuring units is selected as a

primary destination of routing based on the respective load, and that a server terminal is selected as a secondary destination of routing based on its operating state.

Thus, claims 1, 4, and 6-8 are submitted to be definite and to particularly point out and distinctly claim the subject matter which applicants regard as the invention under 35 U.S.C. §112, second paragraph.

REJECTION UNDER 35 U.S.C. §103:

In the Office Action, at pages 6-12, numbered paragraphs 13-17, claims 1, 4, and 6-8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Jindal et al. (USPN 6,327,622; hereafter, Jindal) in view of "Dynamic Computation of TCP Maximum Window Size for Directly Connected Hosts" (hereafter, "IBM technical disclosure"), and further in view of Martin (USPN 6,263,368; hereafter, Martin). . The reasons for the rejection are set forth in the Office Action and therefore not repeated. The rejection is traversed and reconsideration is requested.

As noted above, independent claims 1, 4, 6, 7 and 8 have been amended for clarity.

Jindal recites a central server to distribute application loads to a plurality of servers based on a first status of a first server-selection factor for a first instance of the application and a second status of a first server-selection factor for a second instance of the application (see FIG. 2 and claim 1 of Jindal), wherein the first server-selection factor comprises an application-specific detail and the application specific detail generally comprises one of the set of: number of accesses to the application, number of requests for access to the application, number of electronic mail messages, size of electronic mailbox, and number of electronic mailboxes. As noted by the Examiner, Jindal does not explicitly show the bandwidth measuring parameter for round-trip time, maximum segment size, the adjustable congestion-evading congestion window size for a terminal utilizing TCP or a number of simulated sessions for server terminal utilizing UDP.

The IBM technical disclosure recites using a round-trip time, but the description of the maximum segment size described in COMPUTING WINDOW section, last bullet, simply states: "We also rounded the new computed window to be a multiple of a <u>maximum TCP segment</u> size. This helps in sending more of the complete packets." Hence, the IBM technical disclosure teaches utilizing a computed window to be a multiple of a <u>maximum TCP segment</u> size, <u>not</u> an adjustable congestion-evading congestion window size for a server terminal utilizing TCP, as is recited in the present claimed invention.

With respect to the IBM technical disclosure, the Examiner cites Disclosure text, first bullet, to describe the window for the IBM technical disclosure: "Presented are the design,

analysis and implementation of an algorithm which dynamically adjusts the maximum window size for a TCP connection. Such an algorithm was developed and tested on RISC System/6000*. The current TCP implementations offer fixed window size which cannot be the best for all types of connections. We try to get dynamically the best window on a per connection basis." However, it is respectfully submitted that the Examiner's citation does not describe the algorithm used in the IBM technical disclosure, which is recited in COMPUTING WINDOW, bullets 2-4:

> -It is an iterative approach (Fig. 6). We start with the default window size (window_0) and get the corresponding delay (delay_0). Then, using that delay, we compute the new window size (window_1), and throughput (throughput_0). If the new window size that is computed is at least 10% more than the current window size, then we update the window (else, we have almost reached our best window).
>
> -Now, using this new window (window_1) we again measure the delay (delay_1). From delay_1 and window_1 we compute the new throughput (throughput_1). We test to see if throughput_1 is better than throughput_0. If not, we go back to the old window. If throughput_1 is better, then we compute window_2 from delay_1. Then we again compare window_2 with window_1. If it is more than 10%, then we update the window to window_2.
>
> -And so we continue. Updating our window until we find no significant improvement and/or any degradation in throughput....

Thus, the algorithm taught by the IBM technical disclosure to compute window size is different from the computation of the bandwidth for the window of the present invention "BW = W X MSS/RTT", which is recited on page 26, line 18 of the specification of the present application.

Martin recites, claim 1:

> A message dispatch system for a multi-computer server which comprises a plurality of server computers having respective server network links, said message dispatch system being connectable to an external telecommunications network and comprising:
>
> a message dispatcher configured to receive external client requests for said multi-computer server from said external telecommunications network and to dispatch said client requests to selected server computers via said server network links; (emphasis added)
>
> said message dispatcher being configured to determine one of said server computers to which one of said external client requests is to be dispatched in response to parameters representative of network loading on said server network links; and (emphasis added)
>
> wherein said parameters comprise parameters representative of return traffic on said server network links.

Martin teaches load balancing based on parameters representative of the server network link loading. Although Martin recites that an increasing proportion of the data traffic is in the form of UDP transmissions, and typically, video information is sent using UDP, as opposed to TCP transmissions (col. 6, lines 38-41), Martin generally teaches a message dispatch system for a

multi-computer server for a computer network which provides load balancing on the basis of traffic flow at the edge of the server network. There is no algorithm recited in Martin for determining a desired bandwidth. Although Martin recites "The full loading on the network can (be) measured, even indirectly induced loading (e.g. multimedia UDP streams that are not using the same protocol as the original request) in an embodiment of the invention" (col. 10, lines 60-63), Martin does not teach or suggest that, where UDP is utilized, a number of simulated sessions for a server terminal utilizing UDP is used to select a server terminal for a secondary destination of routing, as is recited in amended independent claims 1, 4, 6, 7 and 8 of the present invention.

Thus, even if combined, Jindal, the IBM technical disclosure and Martin do not teach or suggest the present claimed invention, which recites utilizing a primary destination of routing to a route load measuring unit based on certain parameters and then utilizes a secondary destination of routing to a server based on its operating state, as shown in FIG. 5 and recited in the specification, p. 17, lines 13-25:

> Further, when a request for service is received from the client terminal, the route load measuring unit measures a respective load in the route up to the client terminal and a route load measuring unit is selected as a primary destination by the selecting unit based on the route load. Then this route load measuring unit selects one server terminal in the group as a server terminal for secondary destination of routing. (emphasis added)
>
> Thus, the primary destination of routing the service request is selected based on the path load which reflects the actual situation, and a server terminal is selected as a secondary destination of routing based on its operating state. Therefore, work load can further optimally be distributed among the many server terminals. (emphasis added)

Hence, amended independent claims 1, 4, 6, 7 and 8 of the present invention are submitted to be patentable under 35 U.S.C. §103(a) over Jindal et al. (USPN 6,327,622) in view of "Dynamic Computation of TCP Maximum Window Size for Directly Connected Hosts" (IBM technical disclosure), and further in view of Martin (USPN 6,263,368).

CONCLUSION:

In accordance with the foregoing, it is respectfully submitted that all outstanding objections and rejections have been overcome and/or rendered moot, and further, that all pending claims patentably distinguish over the prior art. Thus, there being no further outstanding objections or rejections, the application is submitted as being in condition for allowance which action is earnestly solicited.

If the Examiner has any remaining issues to be addressed, it is believed that prosecution can be expedited by the Examiner contacting the undersigned attorney for a telephone interview to discuss resolution of such issues.

If there are any underpayments or overpayments of fees associated with the filing of this Amendment, please charge and/or credit the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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